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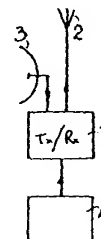
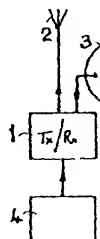
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Radio local area network.

In a radio local area network in which the output power for any transmitter/receiver station is limited to a specified maximum equivalent isotropically radiated power (EIRP), two or more of the transmitter/receiver stations may have separate transmitter and receiver antennae, the receiver antennae being directional high gain antennae such that the range at which two such stations can communicate is correspondingly greater than for stations using omnidirectional receive antennae.



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Radio, or wireless, local area networks are being developed for linking together small computers within a building or other defined small area, or linking small computers to a central facility, without the need for dedicated wiring.

The regulations governing the radio frequencies to be used for such networks limit the maximum transmitted power density to avoid interference between adjacent networks. For example, for the frequency band from 2.4 to 2.5 GHz it is proposed to limit the maximum output power to 100mW equivalent isotropically radiated power (EIRP). In a typical office environment this may result in a "worst-case" reliable range of 50 metres.

According to one aspect of the present invention in a radio local area network system at least two transmitter/receiver arrangements each have separate transmitter and receiver antennae, the respective receiver antennae being high gain antennae whereby the range between said two transmitter/receiver arrangements may be increased.

The receiver antennae may be dish antennae.

According to another aspect of the present invention a transmitter/receiver arrangement for a radio local area network system has separate transmitter and receiver antennae, the receiver antenna being a high gain directional antenna.

The receiver antenna may be a dish antenna.

According to another aspect of the present invention a long range link for a radio local area network comprises two transmitter/receiver arrangements each having separate transmitter and receiver antennae, the respective receiver antennae being high gain directional antennae capable of being aimed towards the transmitter antennae of the respective opposite transmitter/receiver arrangements.

Part of a radio local area network in accordance with the present invention is illustrated in the accompanying drawing, which shows schematically a pair of transmitter/receiver arrangements each having a directional receiver antenna.

Referring to the drawing each of a pair of transmitter/receivers 1 has an omnidirectional transmitter antenna 2 and a directional receiver antenna 3, which may for example be a dish antenna as indicated. The use of such directional antennae enables the establishment of a long-range link in what is essentially a system providing short range links, the two directional receiver antennae 3 being able to pick up usable signals at greater range than omnidirectional antennae. For example, if a dish antenna of 10cm radius is provided for the receivers at either end of a link a 25-fold increase in range is possible, giving a range of more than 1Km. Higher gain receiver antennae, of any type, will allow a proportionate increase in

range without increasing the EIRP. Such links may be used, for example, to connect remote individual users into an existing network.

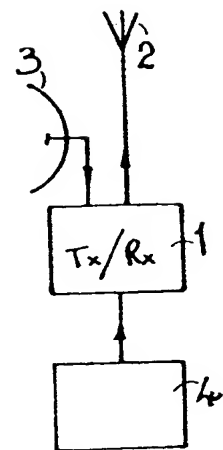
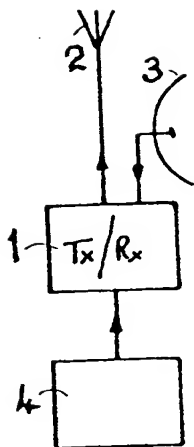
As well as providing digital data links between sources 4, such as computers, the present arrangement may be used to communicate other digital data, analogue data such as video or compressed video, or high quality audio data. Applications may include links to remote tills in large stores, remote surveillance closed circuit cameras or remote alarms.

Alternatively the present arrangement may be used in conjunction with networks utilising lower than the maximum permitted radiated power levels such that cell sizes or the spacing between cells may be reduced without increasing the risk of interference between cells.

The transmitter/receivers 1 may be provided with switch means (not shown) whereby signals may be received selectively either by way of their directional antennae 3 or by way of their omnidirectional antennae 2.

Claims

1. A radio local area network system wherein at least two transmitter/receiver arrangements each have separate transmitter and receiver antennae, the respective receiver antennae being high gain antennae whereby the range between said two transmitter/receiver arrangements may be increased.
2. A radio local area network system in accordance with Claim 1 wherein the receiver antennae are dish antennae.
3. A transmitter/receiver arrangement for a radio local area network system having separate transmitter and receiver antennae, the receiver antenna being a high gain directional antenna.
4. A transmitter/receiver arrangement in accordance with Claim 3 wherein the receiver antenna is a dish antenna.
5. A long range link for a radio local area network comprising two transmitter/receiver arrangements each having separate transmitter and receiver antennae, the respective receiver antennae being high gain directional antennae capable of being aimed towards the transmitter antennae of the respective opposite transmitter/receiver arrangements.





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EUROPEAN SEARCH REPORT

Application Number
EP 94 30 4009

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
Y	EP-A-0 515 728 (KNAPP) * column 4, line 31 - column 5, line 39; figures 7,8 *	1,3,5	H04B1/40 H04L12/28
Y	EP-A-0 488 823 (MOTOROLA) * column 1, line 3 - line 10 * * column 1, line 27 - line 48 * * column 2, line 39 - column 3, line 16; figure 2 *	1,3,5	
A	1993 IEEE MTT-S INTERNATIONAL MICROWAVE SYMPOSIUM DIGEST, Atlanta, GA, USA, 14-18 June 1993, Plattner et al. Pages 853-856 "Indoor and outdoor propagation measurements at 5 and 60 GHz for radio LAN application". * page 853, right column, line 1 - line 35; figure 2 * * page 855, right column, line 1 - line 25; figure 5 *	1-6	
A	IEEE NETWORK MAGAZINE, November 1991 pages 21 - 26 MITZLAFF 'Radio propagation and Anti-multipath techniques in the WIN environment' * page 25, line 15 - page 26, line 60 *	1-6	TECHNICAL FIELDS SEARCHED (Int.Cl.5) H04B H01Q H04L
A	PROCEEDINGS OF THE INSTITUTION OF ELECTRICAL ENGINEERS, vol.122, no.10R, October 1975, STEVENAGE GB pages 953 - 978 DRYBROUGH 'Mobile v.h.f and u.h.f radio systems in the U.K.' * page 970, left column, line 37 - line 50 *	1,3,5	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 18 October 1994	Examiner Goulding, C
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons A : member of the same patent family, corresponding document			



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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.5)
A	NEW ELECTRONICS. INCORPORATING ELECTRONICS TODAY, vol.25, no.4, April 1992, LONDON GB pages 25 - 26 MACLEOD 'pipe in the sky avoids digging up the roads' * right column, line 32 - right column, line 11; figures * -----	1-6	
			TECHNICAL FIELDS SEARCHED (Int.CI.5)
The present search report has been drawn up for all claims			
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CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application I : document cited for other reasons & : member of the same patent family, corresponding document			